5-channel stereo graphic equalizer
BA3822LS/BA3822FS/BA3823LS/BA3824LS

The BA3822LS, BA3822FS, BA3823LS, and BA3824LS are monolithic, five-point stereo graphic equalizer ICs.
Each IC has two channels, and the five center frequencies for each channel are independently set using external capacitors. These ICs feature a wide supply voltage range (V_{CC} = 3.5V to 14V), and are available in compact 24-pin SZIP and SSOP packages, depending on the type. This makes them an ideal choice for home stereo systems, radio cassette players, and car stereos.
The difference between the ICs is the amount of boost and cut control. Choose according to the requirements of your application.

●Applications
Five-point stereo graphic equalizer for home and car stereo systems.

●Features
1) Allows construction of a five-point stereo graphic equalizer with a single IC.
2) Wide supply voltage range (V_{CC} = 3.5V to 14V).
3) Low current consumption (I_Q = 7mA).
4) Available in compact SZIP / SSOP-A24 packages.

●Absolute maximum ratings (Ta = 25°C)

Parameter	Symbol	Limits	Unit
Applied voltage	V_{CC}	16	V
Power dissipation	Pd	500*1 (SZIP) , 800*2 (SSOP)	mW
Operating temperature	Topr	−25~75	°C
Storage temperature	Tstg	−55~125	°C

*1 Reduced by 5mW for each increase in Ta of 1°C over 25°C.
*2 Reduced by 8mW for each increase in Ta of 1°C over 25°C.

●Recommended operating conditions (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply voltage	V_{CC}	3.5	8	14	V

●Electrical characteristics (BA3822LS and BA3822FS)
(Unless otherwise specified, Ta = 25℃, V_{CC} = 8V, V_{IN} = 100mV_{rms} (1kHz), RL = 20kΩ, and F = FLAT)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Circuit current	I_{CC}	4.5	7	9.5	mA	No input
Maximum input voltage	V_{INm}	0.4	0.6	—	V_{rms}	THD=1%
Total harmonic distortion	THD	—	0.1	0.3	%	
Output noise voltage	V_{ND}	—	10	20	μV_{rms}	R_{IN}=2.2kΩ
Input/output gain	G_V	−3	−1.5	0	dB	
Control range	CR	±9	±11	±14	dB	
Stereo crosstalk	CT_{L-R}	60	70	—	dB	Between channels
Stereo balance	CB_{L-R}	−2	0	2	dB	Between channels

●Electrical characteristics (BA3823LS)
(Unless otherwise specified, Ta = 25℃, V_{CC} = 8V, V_{IN} = 100mV_{rms} (1kHz), RL = 20kΩ, and F = FLAT)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Circuit current	I_{CC}	4.3	6.7	9.2	mA	No input
Maximum input voltage	V_{Om}	0.5	0.6	—	V_{rms}	THD=1%
Total harmonic distortion	THD	—	0.01	0.3	%	
Output noise voltage	V_{ND}	—	3	20	μV_{rms}	R_{IN}=2.2kΩ、DIN AUDIO
Input/output gain	G_V	−1.0	0.5	1.5	dB	
Control range	CR	±7	±10	±13	dB	
Crosstalk	CT	60	73	—	dB	Between channels
Channel balance	CB	−1.5	0	1.5	dB	Between channels
Ripple rejection	RR	35	50	—	dB	f=100Hz V_{IN}=−20dBm

●Electrical characteristics (BA3824LS)
(Unless otherwise specified, Ta = 25℃, V_{CC} = 8V, V_{IN} = 100mV_{rms} (1kHz), RL = 20kΩ, and F = FLAT)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Circuit current	I_{CC}	4.5	7	9.5	mA	No input
Maximum input voltage	V_{INm}	0.4	0.6	—	V_{rms}	THD=1%
Total harmonic distortion	THD	—	0.1	0.3	%	
Output noise voltage	V_{ND}	—	10	20	μV_{rms}	R_{IN}=2.2kΩ
Input/output gain	G_V	−3	−1.5	0	dB	
Control range	CR	±6	±8.5	±11	dB	
Stereo crosstalk	CT_{L-R}	60	70	—	dB	Between channels
Stereo balance	CB_{L-R}	−2	0	2	dB	Between channels

●Differences between the BA3822LS, BA3822FS, BA3823LS, and BA3824LS

●Control range gain

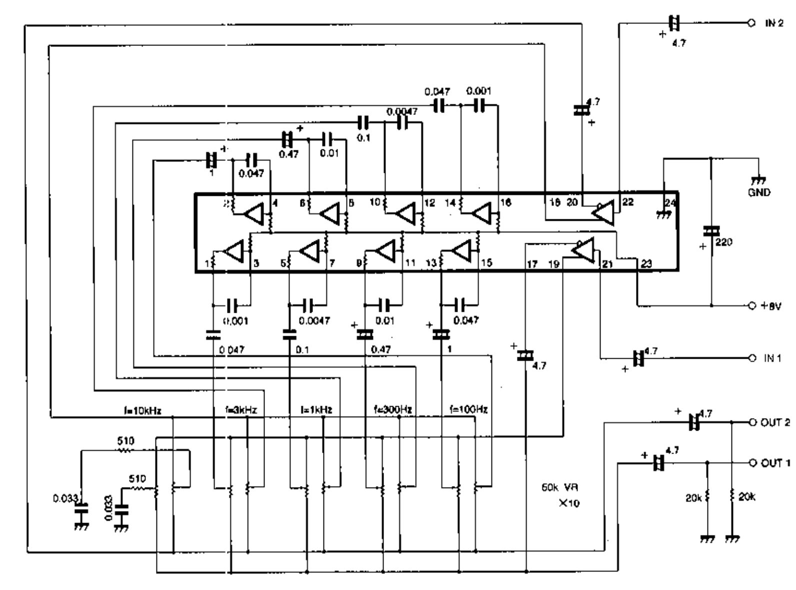
	Control range			Unit
	Min.	Typ.	Max.	
BA3822LS/BA3822FS	±9	±11	±14	dB
BA3823LS	±7	±10	±13	dB
BA3824LS	±6	±8.5	±11	dB

●External component values
As the ICs have different control range gain, the external component values are different for the same center frequencies.

●Ripple rejection
The BA3823LS circuit design has excellent ripple rejection, and the external ripple filter can be omitted.

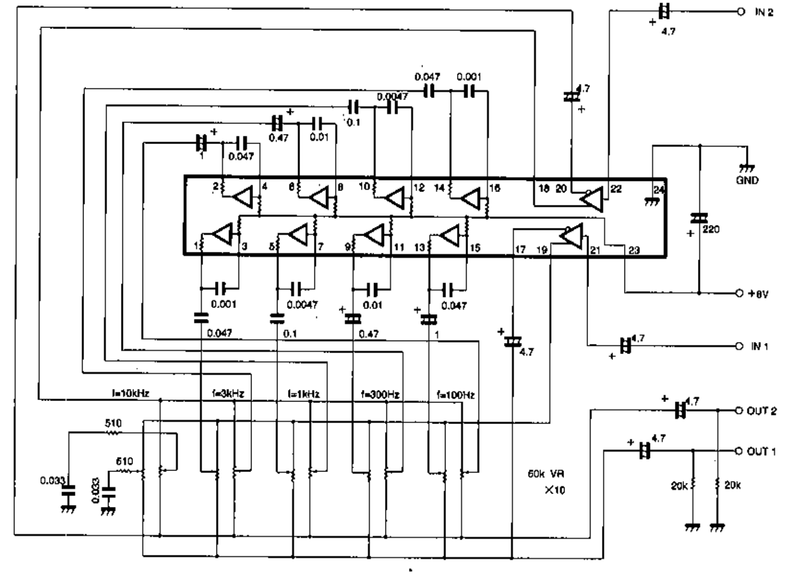
●Application example

BA3823LS



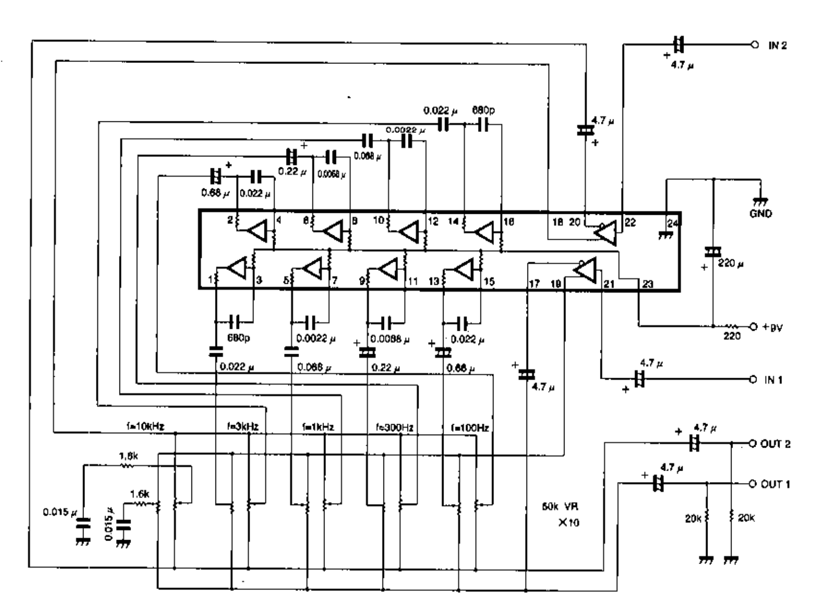
Units:
Resistance (carbon): Ω (±5%)
Capacitance (film): uF (±10%)
Capacitance (electrolytic): μF (±20%)
Capacitance (ceramic): pF (±10%) (680 pF)
Potentiometer: (carbon): 50kΩ, B-type (±10%)

BA3823LS



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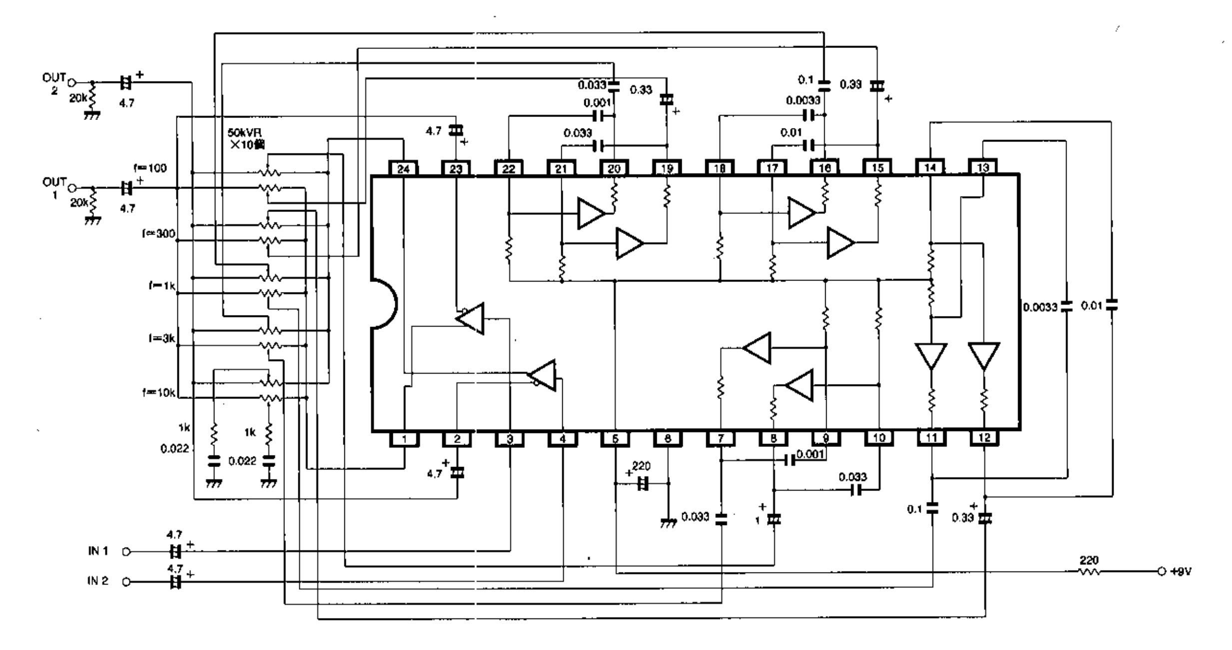
BA3824LS



Units:
Resistance (carbon): Ω (±5%)
Capacitance (film): uF (±10%)
Capacitance (electrolytic): μF (±-20%)
Capacitance (ceramic): pF (±10%) (680 pF)
Potentiometer: (carbon): 50kΩ, B-type (±10%)

●Application example

BA3822FS



Units:
Resistance (carbon): Ω (±5%)
Capacitance (film): uF (±10%)
Capacitance (electrolytic): uF (±20%)
Potentiometer: (carbon): 50kΩ, B-type (±10%)

●External dimensions (Units: mm)

